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More Boy Babies in Post-War Years

FOLLOWING a long war a definite increase in the proportion of male births has repeatedly been observed. This was, for example, the experience of nearly all of the principal European countries engaged in the World War.

Various theories have been advanced in explanation of this phenomenon, but few of them stand the test of thoughtful analysis. Nearly 200 years ago the theologian Johann Süssmilch, observing the circumstance, ascribed it to the interposition of Divine Providence in compensation for the great slaughter of male lives in battle.

Since then various more realistic theories have been advanced. According to one of these, poorly nourished women give birth to a greater proportion of boys than do women who are well nourished, and malnutrition of mothers in post-war years causes a rise in the ratio of boy babies. In support of this view is cited the high ratio of male births in Germany during the famine years of 1918-1919. But, as a matter of fact, a similar rise, although of lesser degree, occurred in most of the allied nations after the War, despite the fact that food shortage and malnutrition were relatively slight in these countries in post-War years. If malnutrition in the mother favors the male as against the female fetus, we should expect to find the same high ratio of male births in the wake of great famines. Careful research has failed to discover any such effect in connection with the terrible periodic famines in India. Furthermore, there is no marked evidence of a special rise in male births either here or abroad as a consequence of the recent world-wide depression.

Other conjectures, more or less ingenious, have been advanced. Among these, the one that commends itself as most plausible relates the increased ratio of male births to the increased proportion of first births occurring as the result of the consummation of marriages that had been postponed by men called to the front.

Such an effect, in so far as it corresponds to reality, would be connected with the influence of the age of the mother on the sex ratio of the infants born, for first births occur in the majority of cases among young mothers. As is shown in Table 1, the ratio of males to females at birth diminishes as the age of

mothers increases. This is especially evident in the case of our native white women, with whom the relative surplus of boy babies shows a consistent decline with advancing age of the mother. Among foreign-born and colored mothers the relation is not so definite, although it is evident that after age 34 the proportion of boy babies born is appreciably less than for younger mothers. Unfortunately, comparative data pertaining to other countries are not available from current reports, the sole exception being Australia, the figures for which essentially agree with those for the United States.

At the first outbreak of hostilities the young male population is drawn for service into the armed forces at the front, and it is this vigorous body of young men that forms the bulk of the fighting forces throughout the war. Consequently, during hostilities, the young women of warring nations are largely prevented from bearing children either through the absence of their young husbands in the army or because no eligible young bachelors are at home for them to marry. Accordingly, so it is reasoned, most births in wartimes are borne by the older married women, with whom boy babies are relatively less common. With the return of the young men at the end of the war, there is a marked increase in marriages and births and, since these are predominantly among young adults, it is only natural that the ratio of boy babies should show a decided rise after a war.

At first sight this theory accords well with the facts. It is noted that the rise in the proportion of male births has been observed chiefly after wars of long duration. It did not occur, for instance, after the Franco-Prussian War, which lasted only a few months. Then again, the increase in male births following the World War was confined almost entirely to the European nations. No such increase was observed in our population, in which at most 4 percent was under arms at any time, and this only for a very short period, whereas in the principal European populations from 15 to 22 percent were so mobilized, in most instances for the entire duration of the War.

But the matter is not so simple. An inspection of the figures for Germany before, during, and after the War raises difficulties in the way of what otherwise would have been a plausible theory. The series of sex ratios and the corresponding series of marriage rates, exhibited in Table 2, is intriguing. True, immediately after the close of the War, in 1919, the sex ratio, 1.080, was at a maximum, markedly above the level of 1.055 in years preceding the War. But if an increase to above normal in the ratio of male to female births resulted from the return of the soldiers, then their absence during the War should have resulted in a ratio below normal, and the rise to above normal at the end of the War should have been abrupt. But, in point of fact, there was no reduction during the War, and no sudden rise upon the return of the soldiers to civil life. On the contrary, all

through the War there was practically a steady increase, from 1.054 in 1913 to 1.056, 1.056, 1.065, 1.069, 1.073 in the succeeding years up to 1918. And these high ratios were experienced at a time when the

TABLE 1

Ratio of Male Live Births per 1,000 Female Live Births, According to Nativity, Color, and Age of Mother, in the United States. 1931 to 1935*

AGE OF MOTHER	NATIVE WHITE			FOREIGN-BORN WHITE			OTHER RACES†		
	Males	Females	Males per 1,000 Females	Males	Females	Males per 1,000 Females	Males	Females	Males per 1,000 Females
TOTAL	4,266,342	4,032,798	1,058	457,559	435,333	1,051	705,929	682,209	1,035
10 to 14 years	2,911	2,686	1,084	38	46	826	4,109	3,848	1,068
15 to 19	501,559	473,171	1,060	10,243	9,897	1,035	148,758	143,504	1,037
20 to 24	1,332,521	1,255,918	1,061	77,603	73,890	1,050	219,720	211,915	1,037
25 to 29	1,127,870	1,066,589	1,057	126,308	119,947	1,053	146,371	142,372	1,028
30 to 34	710,228	672,490	1,056	115,747	109,395	1,058	93,236	89,607	1,040
35 to 39	414,696	393,905	1,053	85,907	82,246	1,045	61,249	59,264	1,033
40 to 44	139,446	133,165	1,047	34,129	32,944	1,036	18,959	18,461	1,027
45 and over	12,207	11,651	1,048	3,819	3,521	1,085	2,799	2,786	1,005
Age not stated	24,904	23,223	1,072	3,765	3,447	1,092	10,728	10,452	1,026

*1931 exclusive of South Dakota and Texas, 1932 exclusive of Texas.
†Mexicans included with colored for the years 1931, 1932, and 1933.

TABLE 2

*Marriages per 1,000 Population and Ratio of Male Live Births per 1,000 Female Live Births in Germany, 1910–1923**

YEAR	MARRIAGES PER 1,000 POPULATION	RATIO OF MALE LIVE BIRTHS PER 1,000 FEMALE LIVE BIRTHS
1910	7.7	1,053
1911	7.8	1,055
1912	7.9	1,059
1913	7.7	1,054
1914	6.8	1,056
1915	4.1	1,056
1916	4.1	1,065
1917	4.7	1,069
1918	5.4	1,073
1919	13.4	1,080
1920	14.5	1,072
1921	11.9	1,073
1922	11.2	1,070
1923	9.4	1,068

*Data for pre-War years not strictly comparable with data for post-War years because of territorial changes.

Source: *Statistisches Jahrbuch für das Deutsches Reich.*

marriage rate was not much more than one half of its previous peacetime value. In 1919 the marriage rate bounded up to 13.4 per thousand from 5.4 in the year preceding, while the sex ratio took only a relatively slight upward step, followed by an actual decline throughout the ensuing years during which the marriage rates were far in excess of the pre-War rates.

It has been suggested that the absence of the men from home during the War was not complete; that, on the contrary, in Germany a definite policy was followed of maintaining always a certain percentage of men on home furlough, with systematic encouragement for the raising of families.

But this alone could not explain the figures for Germany, for, if absence of the young men from home tends to reduce the ratio of male to female births, then sending back home say 5 percent of the men at the front might indeed mitigate this effect, but it could not reverse it so as actually to increase the ratio.

All in all, the facts are perplexing. It cannot be said that the problem is solved. The increase in the ratio of male births after prolonged wars is an established fact. Its explanation for the time being remains something of a mystery.

Age at Marriage and Remarriage

WHAT influence, if any, does the prior marriage of widows or divorcees have upon the relative age of the men who become their partners in a renewed matrimonial alliance? The figures on page 5, based on statistics for Massachusetts, give the answer. Widows or divorcees under age 30 tend to take slightly older husbands than do spinsters of the same age. Above age 30 the situation is reversed; widows and divorcees who marry tend to take somewhat younger husbands than do spinsters marrying at the same age. This statement still holds when special account is taken, not only of the bride's, but also of the bridegroom's prior marital status. The grooms who had been previously married are, however, about 7 years older, on an average, than the corresponding bachelors. This also is clear from the accompanying table.

A few figures from this table may be cited to illustrate the findings a little more in detail. It will be noted, for example, that among brides in the age group 20 to 24 years, the widowed and divorced married bachelors whose average age was 26.6 years, while spinsters married bachelors whose average age was 25.5 years—that is, one year younger than the bachelors chosen by the widowed or divorced. But when we turn to data for brides of ages 30 and over, we find, for example, that among brides of ages 40 to 44 years, those who were widowed or divorced married bachelors with an average age of 41.4 years, whereas those who were spinsters married

bachelors with an average of 42.7 years, a difference of 1.3 years. This difference tends to become greater as the age at marriage advances, and for women in the age group 55 to 59 years it amounts to as much as 5.4 years, the widowed or divorced marrying husbands averaging 53.0 years of age, as against 58.4 for the bridegrooms of spinsters marrying in this age group, 55 to 59.

As already remarked, the general features exhibited in the case of *bachelors* marrying spinsters or previously married women, respectively, are repeated in the corresponding case for men who are contracting a *second* or later marriage. For example, among brides in the age group 55 to 59 who had been previously married, the grooms were, on an average, 61.2 years old; in the corresponding case where the brides were spinsters, the average age of the groom was 63.3 years. It will be noted that, although in this case the grooms were materially older than in the case of bachelors, it still holds true that those who married a widow or divorcee are younger than those who married a spinster.

Average Age of Groom According to Age of Bride Considered Separately for First Marriages and for Remarriages Massachusetts, 1935 to 1937

Age of Bride	Average Age of Groom			
	Groom a Bachelor		Groom Widowed or Divorced	
	Bride a Maid	Bride Widowed or Divorced	Bride a Maid	Bride Widowed or Divorced
Under 20	23.3	25.1	32.4	....
20–24	25.5	26.6	33.1	32.5
25–29	29.1	29.5	36.5	36.8
30–34	33.3	32.8	40.1	40.0
35–39	37.9	37.5	45.0	44.2
40–44	42.7	41.4	49.9	48.3
45–49	46.7	44.8	54.9	53.3
50–54	50.9	49.9	58.8	56.9
55–59	58.4	53.0	63.3	61.2
60–64	61.5	54.0	65.8	64.7
65–69	66.7	59.2	68.6	67.3

Some Comparative Statistics of Population Growth

International population statistics possess a fateful significance at this time. On the one hand, an indefinitely continued excess of births over deaths in any large section of the globe must sooner or later lead to overcrowding and all those stresses for expansion which go with overcrowding, unless a natural outlet by migration is found. At the other

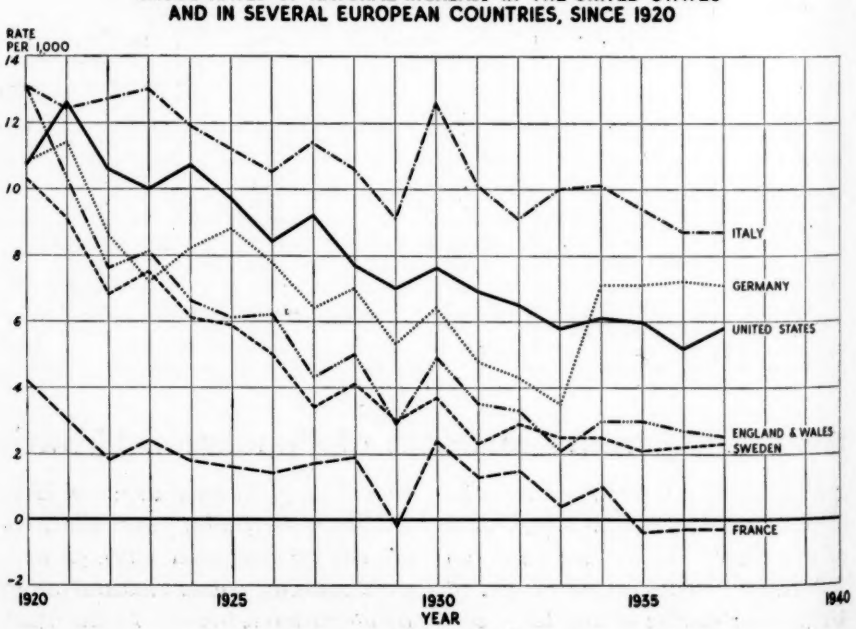
extreme, a continued excess of deaths over births would ultimately lead to depopulation and, finally, to extinction of any group of the human species thus deficient.

Although recently developed methods of analysis tell us that, even with a present excess of births over deaths, a country may be headed for population decline, yet a definite interest attaches to the actually observed excess of births over deaths, especially as these are simple, easily obtained statistical data. These will therefore here be considered first.

In most of the countries of the Western world the birth rate has been declining so much more rapidly than the death rate that the margin between the two—that is, the crude rate of natural increase—has reached critical levels. The decline has been particularly rapid since the World War, with the result that for some countries the margin is almost or quite obliterated. The situation is shown graphically for the period from 1920 through 1937 (the latter being the latest year for which comparable data are available) in the chart below, which exhibits the data for the United States, England and Wales, France, Germany, Italy, and Sweden.

To us, the prime interest naturally is in the United States. The highest value of the crude rate of natural increase during this period was 12.6 per 1,000 in 1921; the lowest value was reached in 1936, namely 5.2, a decline of nearly 60 percent from the

CRUDE RATES OF NATURAL INCREASE IN THE UNITED STATES AND IN SEVERAL EUROPEAN COUNTRIES, SINCE 1920



maximum. Each of the years from 1920 to 1924 witnessed a crude rate of natural increase of at least 10 per 1,000. In contrast with this, no year since 1931 experienced the rate of more than seven per 1,000, and for three years of this latter period the rate has been under six per 1,000. Since 1936 there has been a slight upward movement again, and for 1938 (not shown in the chart) a provisional estimate indicates a crude rate of natural increase of seven per 1,000.

With the United States as a standard, it is of interest to compare the performance of some of the other outstanding countries. With a single exception, in the year 1920, the crude rate of natural increase in the United States has been consistently and substantially greater than that for either England and Wales, Sweden, or France. Thus in 1937 the figure for the United States was 5.8 per 1,000, while England and Wales had a rate of 2.5, Sweden a rate of 2.3, and France fell below the zero line, with an excess of 0.3 per 1,000 of the *death* rate over the birth rate.

On the other hand, in 1937 Italy and Germany stood well above the United States, the former with a crude rate of natural increase of 8.7 per 1,000, the latter with a rate of 7.1 per 1,000. While the figures for the United States were below those for Italy throughout the period of observation, as compared with Germany our country had the advantage from 1920 up through 1933. If our own figures were corrected for the incomplete registration of births, a defect which unfortunately still exists over a considerable area, our relative position as compared with Germany and Italy would be somewhat improved.

To France goes the unenviable distinction of a long record of narrow margins between the birth rate and the death rate. Even before the World War it happened in several years that France recorded more deaths than births. In the period following the War, deaths exceeded births in 1919, in 1929, and in each of the years 1935, 1936, and 1937.

Germany maintained a higher crude rate of natural increase than either England and Wales or Sweden (the curve for which follows a singularly close parallel to that of England and Wales), or France, throughout the period from 1920 to 1937, except in 1920 and 1923. In 1934 the curve for Germany took a sharp rise, symptomatic of the special measures taken at about this time by the administration of that country to advance the birth rate. Italy, though sharing in the general phenomenon of declining birth rates, has nevertheless continued to maintain a crude rate of natural increase in excess of any of the other countries shown on the diagram, throughout the period covered.

While the figures and curves relating to the crude rates of increase are interesting and instructive, they do not really display the most essential characteristic, the true or inherent capacity for population growth, because both birth rate and death rate are materially influenced by the

prevailing age distribution. When this is allowed for by a computation based upon age-specific rates of fertility and of mortality, it is immediately seen that the tendency towards depopulation is much more serious than appears from the crude rate of natural increase alone.* One simple index which can be used to demonstrate the facts is the so-called net reproduction rate, namely, the number of female children that will be born of 100 females traced from birth to the end of their reproductive period, and subjected throughout to the characteristic age-specific rates of fertility and mortality prevailing in the period of observation. The results of the computation of this net reproduction rate for the countries under survey, and for the most recent years for which the data are available, are shown in the table on page 9.

From this table it is seen that, of all the countries shown, only Italy is currently experiencing conditions of fertility and mortality such that the present generation is more than reproducing itself, the net reproduction rate being 118 per 100 in 1933. On the other hand, England and Wales and Sweden, despite their annual excess of births over deaths, have net reproduction rates far from the level necessary to maintain a stationary population, namely, 76 and 70 per 100 respectively. It may come as a surprise to some to learn that the net reproduction rate for France (87 in 1935) differs but very little from that for Germany (89 in 1936), despite the fact that in France deaths exceeded births, whereas Germany, with its recent marked improvement in the birth rate, had a clear excess of births over deaths. This seeming paradox results from the large proportion of the population at the reproducing ages in Germany, as compared with that in France.

The United States, with a net reproduction rate of 95†, is more favorably situated than either England and Wales, France, Germany, or Sweden, and yet its current age-specific rates of fertility and mortality are barely, if at all, sufficient to maintain an ultimate stationary population. Our present excess of births over deaths will gradually be seen to dwindle as the years go by, and will ultimately turn into a deficit as our temporary surplus of population at the reproducing ages gradually disappears. This course of events must definitely be looked for unless an upswing takes place in our net reproduction rate, for it can hardly be expected that our mortality will be very materially improved in the near future. The mortality is a much less elastic characteristic of the population than the fertility. It becomes increasingly difficult to improve mortality conditions as we approach nearer and nearer to the optimum attainable in the present state of medical and sanitary science. On the other hand, it lies in the nature of things,

*See STATISTICAL BULLETIN, September 1937, pages 7 and 8.

†This figure is corrected for unregistered births, assuming 8 percent under-registration.

and it has been practically demonstrated by the fairly successful steps taken in that direction by Germany, that the birth rate is capable of material increase by economic and other public measures. Whether in the course of time anything of that sort will be attempted here may be left to the future to determine. In the meantime it is at least comforting to recognize that, if we have fallen below the strict maintenance level, we have up to date done so only by a small margin, and that a relatively minor effort should suffice to turn the scale and restore a positive balance of births over deaths. Possibly the return of prosperity, or at least the attainment of better economic conditions, for which we are all hoping, may be sufficient to produce this result.

Net Reproduction Rates in the United States and Several European Countries in Recent Years

Country	Year	Net Reproduction Rate*
United States (whites)	1936	95
England and Wales	1934–36	76
France	1935	87
Germany	1936	89
Italy	1933	118
Sweden	1934	70

*Female births per 100 females traced from birth to the end of their reproductive period on the basis of fertility and mortality prevailing in the year indicated.

Mortality Experience of the First Three Months of 1939

ONLY one fourth of the year 1939 has elapsed, but it is already fairly safe to forecast certain developments which should be featured in the mortality record for the year as a whole. Indeed, the health record of the first quarter of any year usually gives us a pretty reliable forecast of the death rate for that year. For, almost without exception, the mortality during the winter season is higher than at other times of the year, and a rise or a fall in the death rate, as compared with previous winters, is very apt to predetermine whether the full year's record will be higher or lower than in earlier years.

So, barring the occurrence of some widespread and fatal epidemic or of some great catastrophe, such as war, we believe that 1939 will be an unusually good health year, although it will not measure up to the record for low mortality established in 1938.

The following data shed light on the state of the Nation's vitality during the first quarter of the current year. In the first place, among the many millions of Industrial policyholders of the Metropolitan Life Insurance Company, the cumulative

death rate was 3 percent above the minimal figure recorded for the like part of 1938, but nevertheless 6.9 percent *below* the average death rate during the first quarter for the last 10 years. As for the general population of the United States, there are available the facts for 86 large cities covering the first 14 weeks of the year. The number of deaths, while exceeding that for the same period of last year, likewise shows that the 1939 mortality rate is below the average for prior years. There are also available the facts for New York City, where the year-to-date death rate for the first 14 weeks of 1939 was 11.7 per 1,000. This, it is true, exceeds the figure for the like part of 1938, but compares favorably with the average of 12.0 per 1,000 for the five years 1933-1937. All three sources of information indicate that health conditions have been maintained on a very high level in the early months of this year in the urban population of the United States. If we assume equally good conditions in the rural districts (for which no data are at hand as yet), it is clear that the country has gotten off to an excellent start with respect to low mortality.

The higher death rate among the insured, as compared with that for the first quarter of 1938, was due almost entirely to a 3.3 percent increase among the white policyholders, as the rate among the colored increased only 0.7 percent.

The diseases that are mainly responsible for the increase in the death rate are influenza, cancer, diabetes, and diseases of the heart and coronary arteries.

Influenza

During the quarter there has been above-average prevalence of influenza, more especially in the Mississippi Valley, the South Atlantic States, and the Central States. The type of influenza that has prevailed has been mild, for the most part, and relatively few cases have been complicated with fatal pneumonia. Nevertheless, the cumulative death rate for cases charged to influenza is 40 percent higher than at this time last year. The pneumonia rate is substantially unchanged but, as is usually the case even in minor epidemics of influenza, there has been a considerable rise in the mortality from heart disease.

Cancer and Diabetes Rates Up

The crude mortality rate from cancer, which resumed its upward swing in 1938, shows a very decided rise (7.4 percent) again this year.

After rising almost continuously over a long series of years, the crude death rate from diabetes dropped 4.3 percent during the full year 1938. It now appears that this decline was only a temporary deviation from the long-time upward trend; for there has been a marked rise (12 percent) as compared with the mortality during the first quarter of last year. Deaths from diabetes usually increase when influenza is prevalent, and this may explain, in part at least, the increase for the current year, to date.

Heart and Coronary Artery Diseases

The heart disease death rate rose 8 percent, and that for coronary artery diseases 25 percent, over last year's figures for the first quarter. With an increase of this magnitude, it is already a certainty that the death rate for diseases of the cor-

Death Rates per 100,000 Persons Exposed. First Quarter of 1939 and 1938 Compared. By Color for Principal Causes of Death. All Ages. Metropolitan Life Insurance Company. Industrial Weekly Premium-Paying Business*

Causes of Death	Death Rates per 100,000 Persons Exposed*					
	Total		White		Colored	
	Jan.-Mar. 1939	Jan.-Mar. 1938	Jan.-Mar. 1939	Jan.-Mar. 1938	Jan.-Mar. 1939	Jan.-Mar. 1938
Total—All Causes	876.5	851.0	806.5	780.7	1,410.5	1,401.2
Typhoid fever	.4	.8	.3	.7	.8	1.2
Communicable diseases of childhood	6.1	8.7	6.2	9.3	5.4	4.0
Measles	1.0	2.9	1.1	3.1	.6	1.4
Scarlet fever	1.2	1.9	1.2	2.1	1.2	.2
Whooping cough	2.3	1.7	2.2	1.8	2.8	1.2
Diphtheria	1.6	2.2	1.8	2.3	.8	1.2
Influenza and pneumonia	97.1	92.0	87.2	82.3	172.2	168.2
Influenza	18.7	13.4	16.0	11.3	39.7	30.1
Pneumonia (all forms)	78.4	78.6	71.3	71.0	132.5	138.1
Bronchopneumonia	31.3	30.4	29.8	29.1	42.7	40.6
Lobar and undefined	47.1	48.2	41.5	41.9	89.8	97.4
Tuberculosis (all forms)	47.4	47.7	34.3	36.4	147.7	136.0
Tuberculosis of the respiratory system	42.7	43.4	31.1	33.1	131.3	124.3
Syphilis, locomotor ataxia, and general paralysis of the insane	11.6	12.0	6.8	7.2	47.9	49.1
Cancer (all forms)	101.9	94.9	101.3	93.5	106.0	105.7
Diabetes mellitus	30.1	26.9	29.8	26.8	32.9	27.9
Alcoholism	1.1	1.9	1.1	1.8	1.6	2.8
Cerebral hemorrhage; apoplexy	66.0	64.1	58.3	54.9	125.1	135.6
Diseases of the heart†	183.0	169.4	170.6	155.0	277.8	282.4
Diseases of the coronary arteries	43.7	35.1	44.9	35.9	34.9	28.7
Angina pectoris	7.9	8.0	8.1	7.9	6.4	8.3
Diarrhea and enteritis	4.9	5.6	4.9	5.6	5.0	5.5
Appendicitis	9.5	10.3	9.2	10.3	11.8	10.5
Chronic nephritis (Bright's disease)	58.3	58.2	50.8	50.7	115.4	117.2
Puerperal state—total	5.3	6.3	4.6	5.9	11.0	9.5
Total external causes	56.7	60.0	53.4	56.4	82.2	87.7
Suicides	8.3	8.6	8.6	9.0	5.4	5.5
Homicides	4.3	4.7	1.8	2.3	23.2	23.0
Accidents—total	44.2	46.7	43.0	45.1	53.5	59.2
Automobile accidents	16.6	18.0	16.3	17.2	18.6	23.9
All other diseases and conditions	145.3	149.1	134.7	140.0	226.5	220.7

*The rates for 1938 and 1939 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†Excludes pericarditis, acute endocarditis, acute myocarditis, coronary artery diseases, and angina pectoris.

onary arteries will reach a new high in 1939.

All of the principal communicable diseases of childhood, save whooping cough, have caused fewer deaths than in the January-to-March period of 1938. Sizable reductions for scarlet fever and diphtheria, both of which registered new minima last year, presage still lower mortality rates for 1939. For tuberculosis the decline is very slight, but there is still good ground for the hope that the rate at the end of the year will mark yet another new low point. The death rate for syphilis is down 3.3 percent.

The most significant reductions, however, are those for diarrheal conditions (13 percent) and diseases of the puerperal state (16 percent). In the case of the latter, this very considerable decline, if still in evidence at the end of the year, will result in a death rate of approximately one third the figure registered only 10 years ago.

Drop in Deaths From Violence

Gratifying declines have been observed so far this year in the death rates from suicide, homicide, accidents (all forms combined), and automobile fatalities.

Leprosy and Tuberculosis

TO THE average layman, leprosy seems almost a legendary thing, an Oriental horror of biblical times. Unfortunately it is not a legend, and it is not restricted to the Orient nor to biblical times. According to one estimate, at the present time there are still, in various parts of the world, about 3,000,000 people afflicted with this disease, the seriousness of which has not been exaggerated. Very fortunately, however, in most civilized countries today leprosy is so rare as to amount to a medical curiosity. Thus, in the United States, out of an annual total of nearly 1,500,000 deaths, only about 30 are recorded from leprosy each year. Yet in the Middle Ages leprosy was fearfully common throughout the whole of Europe. What is it that has so set our house in order, that has swept our abode so clean of the dread disease?

This question is not prompted by mere academic curiosity. If we understood the answer, it might throw light on current medical problems. For there are signs that today tuberculosis is also on the way out, following a course perhaps analogous to that of leprosy in the past. Yet we do not fully understand just what is going on. If we did, perhaps we could further hasten the process of elimination. However that may be, it is a fact that the analogy between the disappearance of leprosy in past centuries and the rapid decline in tuberculosis since the beginning of the current century is not a mere surface analogy.

The two diseases have many points in common. Both the tubercle bacillus and the bacillus of leprosy belong to the class of so-called acid-

fast bacteria. They seem to owe some of their properties to the fact that they have an outer coating of a waxy substance. In certain of their clinical aspects also the two diseases show resemblances. Both are infectious, but only in moderate degree, and with the period of incubation commonly so prolonged that it is impossible to trace the source of infection because of the long time that may have elapsed between the infection and the overt appearance of the disease. Both diseases are very refractory to treatment, so that complete cures are perhaps never effected. Both diseases tend to run a very prolonged chronic course. For both diseases institutional treatment, with at least a moderated plan of segregation, is indicated, not only to reduce the chances of spread but also because experience has shown a distinct benefit to the patient. Again, in both diseases, hereditary predisposition seems to play a role in determining the victims, and certain races of mankind seem to be especially vulnerable—Mongolians, for example, to leprosy; Negroes, to tuberculosis.

Finally, in both cases, the precise cause of the decline is still an open problem, and some of the explanations that have been offered present an analogy. For according to one interpretation, the disappearance of leprosy has been related to the immense mortality that occurred at the time of the Black Death and later epidemics of the bubonic plague, smallpox, etc. It has been suggested that at that time the lepers segregated in various institutions may have been particularly struck, so that most of the lepers of Europe were wiped out by the plague, and the few who survived were too scattered to form a self-perpetuating focus of disease. A certain plausibility attaches to this explanation, particularly in view of the relatively low order of infectiousness of the disease, so that once the foci were reduced in number, it might very well happen that they were no longer sufficient to perpetuate the disease.

It is not without interest to observe that something analogous to this seems to have happened to tuberculosis in the wake of the influenza epidemic of 1918-1919. It is well known that immediately after this epidemic the death rate from tuberculosis took a rather sudden plunge, and that it has ever since dropped to lower levels than before. It is true that this phenomenon itself is by no means clearly explained. A seemingly obvious interpretation, namely, that it was due to the killing off by the epidemic of persons actually suffering from tuberculosis or susceptible to it, is not fully borne out when the details of the case are examined. For, as we have pointed out elsewhere, the same sudden plunge downward of mortality after the influenza epidemic was observed for certain other causes, such as heart disease, for which the explanation is hardly tenable, because of the peculiarities of the age incidence of the influenza epidemic. Examination of the figures shows that the sudden decline in mortality

from certain of these causes occurred in age groups which had been relatively little affected by the influenza epidemic. This fact throws doubt on what otherwise would seem an obvious explanation for the sudden fall in mortality from tuberculosis after the influenza epidemic.

Thus for both diseases, the cause of the relatively sudden decline is something of a mystery. In the case of tuberculosis, of course, modern methods of educating the patient to an appropriate mode of life, and the development of rational handling of the cases, has beyond all doubt been an important factor in the great improvement that has taken place in past decades.

With these many points of analogy between the pathogenic organism responsible for tuberculosis and leprosy respectively, there may be significance in recent announcements of some promise of success with chemotherapy aimed primarily at tuberculosis, but possibly to be extended also to leprosy. A preparation of sulfanilamide and a fat derived from cocoanut oil has been found to prevent the growth of tubercle bacilli *in vitro*, and has also been found effective in checking the development of the disease in guinea pigs inoculated with the tubercle bacillus. Results so far are altogether provisional and no experiments on human beings have been made.

Our World's Fairs Exhibits

THE Metropolitan Life Insurance Company cordially invites readers of the STATISTICAL BULLETIN to attend its exhibits in the Business Systems and Insurance Building, New York World's Fair, and in the Hall of Science, Golden Gate International Exposition, San Francisco, Calif.

Health Record for March 1939

THE death rate of the Metropolitan Industrial policyholders in March of this year (9.0 per 1,000) was, with only two exceptions, the lowest ever recorded for the month in the history of this representative cross-section of the population of the United States and Canada. The rate this year compares favorably with the average for March of 9.4 per 1,000 over a period of 10 years.

In a group of 88 large cities in the United States, the health record for the month was also favorable.

The following table shows the mortality among Industrial policyholders for March 1939, February 1939, and March 1938, together with the death rates for the first three months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Death Rate per 100,000 for Principal Causes. Weekly Premium-Paying Business in Industrial Department. All Ages (Annual Basis).*

MONTHS OF MARCH 1939, FEBRUARY 1939, AND MARCH 1938

CAUSES OF DEATH	ANNUAL RATE PER 100,000 LIVES EXPOSED*				
	March 1939	February 1939	March 1938	Cumulative January-March	
				1939	1938
TOTAL—ALL CAUSES	900.3	870.6	835.2	876.5	851.0
Typhoid fever	.3	.2	.9	.4	.8
Measles	1.2	.8	3.9	1.0	2.9
Scarlet fever	1.1	.8	1.9	1.2	1.9
Whooping cough	2.6	2.4	1.7	2.3	1.7
Diphtheria	.9	1.8	1.3	1.6	2.2
Influenza	28.4	13.0	10.6	18.7	13.4
Pneumonia (all forms)	82.0	76.1	74.5	78.4	78.6
Tuberculosis (all forms)	50.9	43.5	49.2	47.4	47.7
Tuberculosis of respiratory system	45.8	40.6	44.1	42.7	43.4
Syphilis, locomotor ataxia, and general paralysis of the insane	11.9	10.5	11.6	11.6	12.0
Cancer (all forms)	99.6	99.2	93.3	101.9	94.9
Diabetes mellitus	29.9	27.7	26.5	30.1	26.9
Cerebral hemorrhage; apoplexy	64.4	68.5	62.2	66.0	64.1
Diseases of the heart†	180.2	183.1	169.3	183.0	169.4
Diseases of the coronary arteries	43.1	43.1	33.8	43.7	35.1
Angina pectoris	7.4	8.2	7.3	7.9	8.0
Diarrhea and enteritis	4.3	5.8	4.8	4.9	5.6
Appendicitis	10.6	8.6	11.0	9.5	10.3
Chronic nephritis (Bright's disease)	59.9	56.5	55.4	58.3	58.2
Puerperal state—total	4.9	5.8	6.0	5.3	6.3
Suicides	7.1	8.1	9.9	8.3	8.6
Homicides	3.5	3.6	4.6	4.3	4.7
Accidents—total	40.2	41.0	42.7	44.2	46.7
Automobile accidents	13.1	14.8	15.7	16.6	18.0
All other diseases and conditions	166.1	162.2	152.9	146.5	151.0

*The rates for 1938 and 1939 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†Excludes pericarditis, acute endocarditis, acute myocarditis, coronary artery diseases, and angina pectoris.

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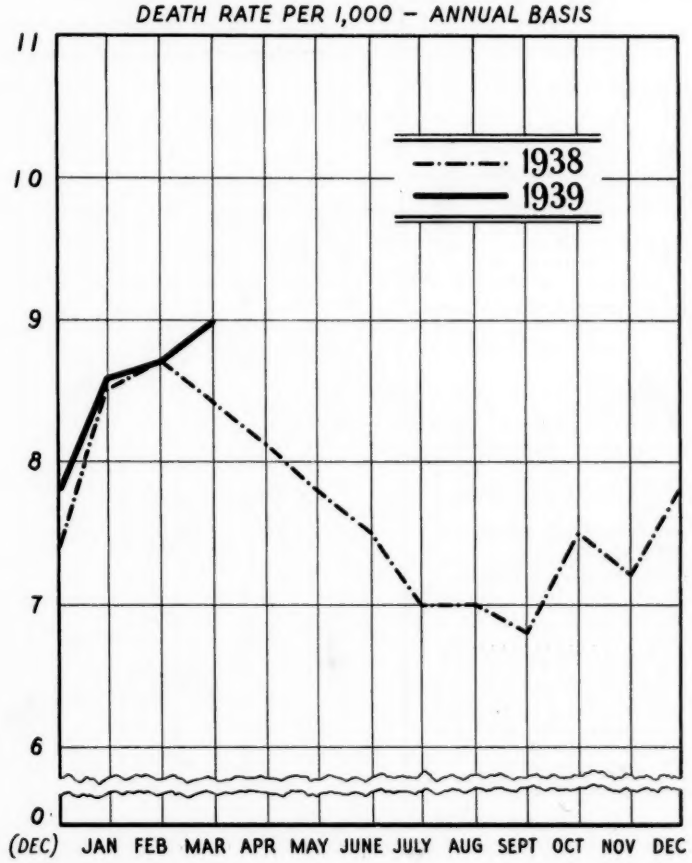
DEATH RATES FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
WEEKLY PREMIUM-PAYING BUSINESS – TOTAL PERSONS



Rates are provisional

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